# SECURITIES TRADING INFRASTRUCTURE MODEL

## MODEL OVERVIEW

Modern finance depends on the integrated operation of many markets that trade securities, commodities, currencies, and an ever-increasing number of derived financial products. Financial markets must be reliably accessible to traders, and they depend on clearance and settlement systems to reliably process millions of negotiated transactions daily. While firms protect against localized service disruptions because of past experience, they may not have protections against disruptions that have not occurred but would be consequential, such as concurrent problems affecting many institutions or services. Seemingly disparate communication pathways can overlap to create common modes of failure across seemingly independent systems, raising the likelihood of concurrent function loss from disruption of a single asset. The Securities Trading Infrastructure Model (STIM) provides a capability to model these information flows and underlying communications system dependencies and assess possible risk mitigations.

## MODEL CHARACTERISTICS

▸ Represents core business processes (trade matching, clearing, settlement) driving data flows.
▸ Allows decision makers to estimate the consequences to wholesale financial operations from disruptions to communications assets and other supporting infrastructure.
▸ Is configurable to model institutional, regional, or national problems.
▸ Incorporates basic trader behavior coupled with trade-matching algorithms, clearing and settlement of trades, and the information flows required for post-trade processing.

### OUTPUT

▸ Transaction flows under normal and disrupted conditions.
▸ Inter-bank payments associated with trade settlement.



## MODEL APPLICATIONS

Demonstration analysis of consequences of communication center disruption.

## QUESTIONS ADDRESSED

Given a functional failure of some part of the system (institution, facility, or network) or some part of the supporting infrastructure, NISAC can answer the following types of questions:

▸ Which firms might experience operational problems because of limited data communication?
▸ How would trade processing be affected?
▸ Would some financial institutions have unusual funding gaps?
▸ How effective would specific changes to the system (redundancy, shorter recovery times) be in reducing impacts?
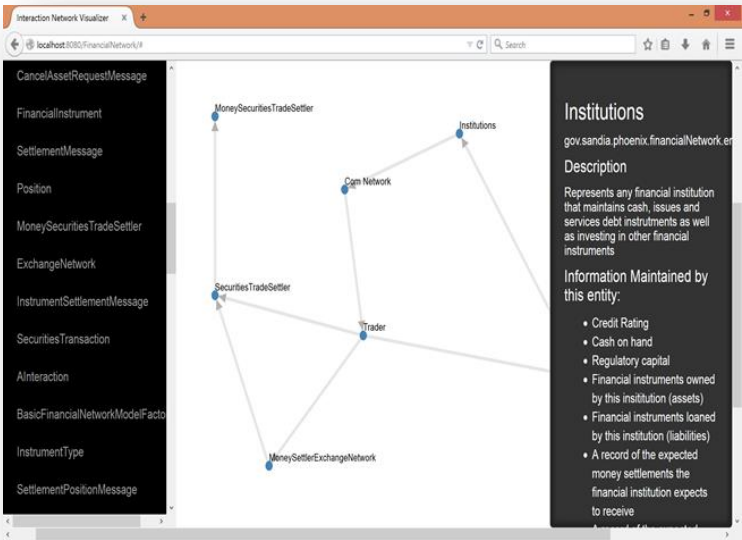
## ABOUT OCIA

The Department of Homeland Security, National Protection and Programs Directorate's (NPPD) Office of Cyber and Infrastructure Analysis (OCIA) manages NISAC, which is a Congressionally mandated center of excellence in modeling, simulation, and analysis of critical infrastructure.

## CONTACTS

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